branchs which devour Balistes. It is only due to my excellent assistant, Mr. James Hornell, to state that our observations on pearl formation are mainly due to him. During the comparatively limited time (under three months) that I had on the banks, I was mainly occupied with what seemed the more important question of the life-conditions of the oyster, in view of the frequent depletion of particular grounds. It is important to note that these interesting pearl-formation parasites are not only widely distributed over the Manaar banks, but also on other parts of the coast of Ceylon. Mr. Hornell has found Balistes with its Cestode parasite both at Trincomalie and at Galle, and the sharks also occur all round the island, so that there can be no question as to the probable infection of oysters grown at these or any other suitable localities.

There is still, however, much to find out in regard to all these points, and other details affecting the life of the oyster and the prosperity of the pearl fisheries. Mr. Hornell and I are still in the middle of our investigations, and this must be regarded as only a preliminary statement of results which may have to be corrected, and I hope will be considerably extended in our final report.

It is interesting to note that the *Ceylon Government Gazette* of December 22 last announced a pearl fishery, to commence on February 22, during which the following banks would be fished :—

The South-East Cheval Paar, estimated to have 49 million oysters.

The East Cheval Paar, with 11 millions.

The North-East Cheval Paar, with 13 millions.

The Periya Paar Kerrai, with 8 millions—making in all more than 80 million oysters.

That fishery is now in progress, Mr. Hornell is attending it, and we hope that it may result not merely in a large revenue from pearls, but also in considerable additions to our scientific knowledge of the oysters.

As an incident of our work in Ceylon, it was found necessary to fit up the scientific man's workshop—a small laboratory on the edge of the sea, with experimental tanks, a circulation of sea-water and facilities for microscopic and other work. For several reasons [discussed in the lecture] we chose Galle at the southern end of Ceylon, and we have every reason to be satisfied with the choice. With its large bay, its rich fauna and the sheltered collecting ground of the lagoon within the coral reef, it is probably one of the best possible spots for the naturalist's work in eastern tropical seas.

In the interests of science it is to be hoped, then, that the marine laboratory at Galle will soon be established on a permanent basis with a suitable equipment. It ought, moreover, to be of sufficient size to accommodate two or three additional zoologists, such as members of the staff of the museum and of the medical college at Colombo, or scientific visitors from Europe. The work of such men would help in the investigation of the marine fauna and in the elucidation of practical problems, and the laboratory would soon become a credit and an attraction to the colony. Such an institution at Galle would be known throughout the scientific world, and would be visited by many students of science, and it might reasonably be hoped that in time it would perform for the marine biology and the fishing industries of Ceylon very much the same important functions as those fulfilled by the celebrated gardens and laboratory at Peradeniya for the botany and associated economic problems of the land. W. A. H.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

MR. F. C. MCCLELLAN has been appointed to the new chair of forestry and estate management at the Royal Agricultural College, Cirencester.

THE new science buildings of the Colston's Girls' School, Bristol, will be opened on Friday, May 15, by the Right Hon. Henry Hobhouse, M.P.

WE have received a copy of the University of Colorado *Bulletin* for December, 1902. It contains a detailed account of the quarto-centennial celebration held at the end of last year in connection with the University of Colorado, when addresses were delivered by Profs. A. Reed, F. S. Lee, D. C. Jackson, and others.

THE Council of the Manchester Literary and Philosophical Society has appointed Mr. A. P. Hunt, sublibrarian of Balliol College, Oxford, to be assistant secretary and librarian to the Society, in succession to Mr. Charles Leigh, who has been appointed deputy librarian of the Owens College, Manchester.

THE second volume of the Report of the U.S. Commissioner of Education for the year 1900–1901 runs, like the former part, to more than twelve hundred pages. A large portion of the volume is concerned solely with statistics, and these refer to every grade of education. Uninteresting though these masses of figures are likely to prove to ordinary teachers, they will be found of great value by the student of educational problems. The descriptive article which will most directly appeal to men of science is one on instruction in mining engineering. It appears that the first school of mines in the United States was established in New York City in 1863, in connection with the institution which later developed into the existing Columbia University. At the close of 1901 there were thirty-seven institutions offering courses in mining engineering, two of the courses—those in connection with the University of North Carolina and the University of Texas—having been instituted in 1901. The article also contains short accounts of the systems of instruction in mining in each of the thirty-seven institutions holding courses. A chapter is given to consular reports sent home to the United States by its consuls in different parts of the world, and these reports contain many hints likely to be of practical value to the lecturers and others in American colleges. One chapter appears out of place in an educational report, since it is concerned with the introduction of domestic reindeer into Alaska.

THE first part of vol. xiv. of the *Transactions* of the South African Philosophical Society contains an instructive paper by the Rev. Dr. Flint on the legal and economic bases of some colonial teaching universities, which concludes with the local application of the results of the inquiry. The paper summarises the salient facts in the history of the important colonial universities, but it is only possible here to refer to one or two points of interest. The Government of New South Wales voted at its establishment 50,000*l.* for the buildings of Sydney University. An endowment of not more than 20,000*l.*, with an annual sum of 500*l.* for the stipend of the principal, was provided for each college incorporated within Sydney University upon the condition that 10,000*l.* at least shall have been subscribed by its founders, the whole to be voted to the erection of buildings on land granted for the purpose. New Zealand University has also been generously treated by its Government, from which source it receives an annual grant of 3000*l.* But in addition to this the four affiliated colleges have received land grants to the extent of 40,000 acres, and Otago, for instance, receives in rent from lands granted in this way about 650*l.* per year. Similarly, the University of Adelaide received from South Australia a grant of 50,000 acres. The University of Melbourne appears to receive in Government grants some 13,500*l.* It is well that these examples, which do not by any means exhaust the instances given in the paper, should be brought prominently before the people of South Africa, in view of the growing feeling that a worthy teaching university for the whole of South Africa is much needed.

THE annual discussion before the Washington meeting last January of the American Society of Naturalists dealt with the question: How can endowments be used most effectively for scientific research? The speeches on this occasion are printed in *Science* for April 10. Prof. T. C. Chamberlin advocated the special endowment of chairs of research. There ought no longer, he said, to be a struggle on the part of the capable investigator to free himself from obligations to teach that he may devote himself to creative work. From 20,000*l.* to 40,000*l.* would effectively endow a chair of research, though Prof. Chamberlin argued later that the endowment should be made to the department rather than a specific chair, thus distributing the function of research among the members of the staff according to

their capabilities and tastes. Prof. W. M. Wheeler showed how large a part of the value of fellowships was lost to research by expecting fellows to perform extraneous duties and to do their research always at a given institution. Prof. Münsterberg insisted that the only two factors which really count for research are to be found in the minds of the men engaged upon it; they are, first, intellectual quality, and secondly, the will to achieve. In these two respects he maintained American research to be defective. He urged the men of wealth who had millions ready for endowment first to make the career of research attractive, so that more men of first-class type may be tempted, and to create great premiums by putting above the present university system a still higher institution, an over-university where the finest masters of research, chosen by their peers, are brought together for far-reaching work which transcends the possibilities of the educational institutions. Whatever can be done to give the career national glory thus to attract the finest men will be productive for the work of research. To secure that able men shall do their best work he advised the following course:—Make the academic career in the real universities, the promotion to higher positions, dependent in first line upon research work, as it is in Germany, and the work will be done, in spite of all obstacles. There is at present no greater educational need than to educate the trustees and benefactors of universities.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, March 26.—"Some Physical Properties of Nickel Carbonyl." By James **Dewar**, M.A., Sc.D., LL.D., F.R.S., and Humphrey Owen **Jones**, M.A., B.Sc.

The authors' communication gives an account of the investigation of a number of the physical properties of nickel carbonyl which have hitherto been investigated only to a slight extent.

It was found that the compound in the gaseous state was much more stable than it had hitherto been supposed to be, and that no explosion took place when the vapour was suddenly heated, provided that oxygen was not present in the surrounding gas. When the vapour was decomposed by heat the products of dissociation were nickel and carbon monoxide; at temperatures below 180° C. only traces of carbon dioxide could be detected, so that the decomposition postulated by Berthelot to explain the explosion of the vapour does not take place to any appreciable extent.

A large number of vapour density determinations were made by Victor Meyer's method at a number of temperatures between 63° C. and 216° C. in an atmosphere of various inert gases (hydrogen, nitrogen and ethylene), and also in carbon monoxide.

The effect of temperature, of rate of admixture of the vapour with the surrounding gas by diffusion, and of the presence of one of the products of dissociation on the extent of the dissociation is very clearly seen from the numerical values and the curves.

A number of determinations of the vapour-density at various temperatures under reduced pressure were made, and also show the marked effect of temperature on the dissociation. The dissociation becomes practically complete only at the boiling point of aniline.

The critical temperature was found to be about 200° C., and the critical pressure was estimated to be about thirty atmospheres.

A number of vapour-pressure determinations were made by the statical method over a range of temperature between −9° C. and +30° C. From the values obtained, the Rankine formula gives the following relation between the absolute temperature T and the pressure p in millimetres of mercury:—

$$\log p = 7{\cdot}355 - 1415/T.$$

The results are compared with those obtained by Mittasch by the dynamic method.

Various constants are calculated from the results obtained, and these are found in several cases to be very similar to the corresponding constants for ether. The latent heat of vaporisation is 38·1 calories per gram, and the Trouton constant is 20·6. The molecule of nickel carbonyl appears to be 4.2 times larger than that of carbon monoxide.

Some experiments which were made show that the reaction between carbon monoxide and nickel is reversible, and proceeds rapidly at the ordinary temperature, and with a measurable velocity at very low temperatures.

Royal Microscopical Society, April 15.—Dr. Hy. Woodward, F.R.S., in the chair.—Mr. F. W. **Millett's** report on the recent Foraminifera of the Malay Archipelago collected by Mr. A. Durrand, part xiv., was taken as read.—The secretary read a paper by Mr. E. B. **Stringer** on a new method of using the electric arc in photomicrography. The method consists in employing the radiation of the electric arc itself altogether separated from the incandescent carbons. This, modified by certain light filters, yields a powerful violet monochromatic light on the extreme limit of visibility. The separation is effected by the substage diaphragm, the opening in which is adjusted so as to allow only the radiation of the arc to pass. A trough containing a solution of ammoniated sulphate of copper suppresses all but the violet band, and the ultra-violet rays are intercepted by another trough containing a solution of sulphate of quinine. Lantern slides of *Pleurosigma angulatum*, dry, and *Coscinodiscus asteromphalus* in styrax, taken with a Zeiss 3 mm. oil immersion apochromatic objective of 1·4 N.A. and 8 compensating eye-piece giving a magnification of 2200 diameters, were shown upon the screen. The author discussed the possibility of obtaining lenses corrected for the ultra-violet rays which would enable photography to do for the microscope what it had already done for the telescope. Three slides of *Navicula bombus* were shown on the screen to demonstrate the advantage of using the troughs containing solutions of ammoniated sulphate of copper and sulphate of quinine.—Dr. R. **Hamlyn-Harris** sent a description of an apparatus for facilitating the manipulation of celloidin sections. The apparatus consisted of a circular vessel $3\frac{1}{2}''$ diameter and $\frac{1}{8}''$ deep outside. The body is made of a non-corroding metal, and the bottom of brass. It is divided into twenty compartments; in each compartment are perforations to allow fluid to escape when the transfer is made from one fluid to another. The apparatus suggested itself to the writer's mind in consequence of the difficulties experienced by him in preparing, staining, and mounting a series of celloidin sections in successive order.—Mr. C. F. **Rousselet** exhibited about two dozen mounted slides of Rotifers of the genus Brachionus. The specimens, besides those collected in England, came from America, Asia Minor, Bohemia, China, Germany, and Hungary, and comprised sixteen species, including one not yet described, and a number of varieties. The author mentioned that the *B. reubens* exhibited was the true species of Ehrenberg, and different from the one figured under that name in Hudson and Gosse's monograph.

PARIS.

Academy of Sciences, April 20.—M. Albert Gaudry in the chair.—Statistics of the minor planets. The distribution of the elements taking the aphelia as the argument, by M. O. **Callandreau.** The aphelia distances arrange themselves symmetrically about their mean value in a manner resembling the arrangement of accidental errors.—On spirillosis in the Bovidæ, by M. A. **Laveran.** An account, with drawings, of the detailed examination of the blood of Transvaal cattle infected with spirilla. These parasites have always been found in the blood of cattle associated with other organisms. At the present time only two diseases are definitely known to be produced by spirilla, the relapsing fever caused by *Sp. Obermeieri*, peculiar to man, and the spirillosis produced by *Sp. anserinum*. The parasite described in the present paper forms a new species, to which the name *Sp. Theileri* is given.—On the integration of differential equations of the second order with constant coefficients, by M. E. **Vallier.**—The specific heats and heats of vaporisation and of fusion of aniline and some other organic compounds, by M. **de Forcrand.** The specific heat of aniline in the solid and liquid state and of the latent heat of fusion has been determined by the method of mixtures. Measurements are also given for nitrobenzene, benzene, and acetic acid.—Photographic observation of the eclipse of the moon on April 11, 1903, at the Observatory of Toulouse, by M. **Montangerand.** The atmospheric conditions on the night of the eclipse were